

REMARKS

The Office Action dated February 6, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-18 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claims 19-20 have been added. No new matter has been added and no new issues are raised which require further consideration or search. Therefore, claims 1-20 are currently pending in the application and are respectfully submitted for consideration.

The Office Action rejected claims 2, 8, 13, 17, and 18 under 35 U.S.C. §102(e) as allegedly anticipated by Norefors, et al. (U.S. Patent No. 6,370,380) (“Norefors”). The Office Action alleged that Norefors discloses or suggests every claim feature recited in claims 2, 8, 13, 17, and 18. The rejection is respectfully traversed for at least the following reasons.

Claim 2 recites a method, which includes generating a token by a first access router to which a mobile node was previously attached, and sending the token from the first access router to the mobile node within a message comprising a list of candidate access routers. The method further includes sending the token from the mobile node to a second access router as selected candidate after a handover procedure between the first and second access routers, and sending the token within an exchange between the access

routers specific to a candidate access router discovery procedure from the second access router back to the first access router for verification.

Claim 8 recites a system, which includes a first access router, a mobile node, and a second access router. The first access router includes a generating unit configured to generate a token, and a first sending unit configured to send the token to the mobile node within a message comprising a list of candidate access routers. The mobile node includes a second sending unit configured to send the token to the second access router as selected candidate after a handover procedure between the access routers. The second access router includes a third sending unit configured to send the token within an exchange between the access routers specific to a candidate access router discovery procedure back to the first access router and a verification unit configured to verify the token.

Claim 13 recites an apparatus, which includes a generator configured to generate a token, and a first transmitter configured to send the token to the mobile node within a message comprising a list of candidate access routers. The apparatus further includes a second transmitter configured to send the token within an exchange with another access router specific to a candidate access router discovery procedure to the other access router, and a verifier configured to verify the token.

Claim 17 recites a system, which includes a first access router, a mobile node, and a second access router. The first access router includes generating means for generating a token, and first sending means for sending the token to the mobile node within a message comprising a list of candidate access routers. The mobile node includes second sending

means for sending the token to the second access router as selected candidate after a handover procedure between the access routers. The second access router includes third sending means for sending the token within an exchange between the access routers specific to a candidate access router discovery procedure back to the first access router and verification means for verifying the token.

Claim 18 recites an apparatus, which includes generating means for generating a token, and first sending means for sending the token to a mobile node within a message comprising a list of candidate access routers. The apparatus further includes second sending means for sending the token within an exchange with another access router specific to a candidate access router discovery procedure to the other access router, and verification means for verifying the token.

Claim 19 recites a method, which includes generating a token by a first access router to which a mobile node was previously attached, and sending the token from the first access router to the mobile node within a message comprising a list of candidate access routers. The token is sent from the mobile node to a second access router as selected candidate after a handover procedure between the first and second access routers, and the token is sent within an exchange between the access routers specific to a candidate access router discovery procedure from the second access router back to the first access router for verification.

Thus, according to embodiments of the invention, denial-of-service attacks can be reduced while implementing a Candidate Access Router Discovery (“CARD”) protocol. Specifically, according to embodiments of the invention, a smart cache replacement policy is employed to ensure that valid cache entries are given highest priority and that information gathered from locally connected mobile terminals is favored, which inherently diminishes the effect of a distributed denial-of-service attack.

As will be discussed below, Norefors fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Norefors generally discloses, in a mobile, wireless telecommunication network, a method for achieving secure handover of a mobile terminal from a first access point to a second access point, wherein the first access point and the second access point are physically connected through a fixed network. Norefors generally discloses that this is accomplished by transmitting a security token from the first access point to the mobile terminal, and then from the mobile terminal to the second access point, over the radio interface. (see Norefors at Abstract).

Applicants respectfully submit that Norefors fails to disclose, teach, or suggest, all of the elements of the present claims. For example, Norefors fails to disclose, teach, or suggest, at least, an access router, as recited in claims 2, 8, 13, 17, 18, and 19.

Because Norefors fails to disclose, teach, or suggest, at least, an access router, for reasons which will be discussed below, Norefors fails to disclose, teach, or suggest, the following limitations:

- “generating a token by a first access router to which the mobile node was previously attached” (claims 2 and 19);
- “sending the token from the first access router to the mobile node within a message comprising a list of candidate access routers” (claims 2 and 19);
- “sending the token from the mobile node to a second access router as selected candidate after a handover procedure between the first and second access routers” (claims 2 and 19);
- “sending the token within an exchange between the access routers specific to the discovery procedure from the second access router back to the first access router for verification” (claims 2 and 19);
- “a first access router” (claims 9 and 17);
- “said mobile node and a second access router,” (claims 9 and 17);
- “wherein, the first access router includes a generating unit configured to generate a token, first sending unit configured to send the token to the mobile node within a message comprising a list of candidate access routers,” (claims 9 and 17);

- “wherein the mobile node includes second sending unit configured to send the token to the second access router as selected candidate after a handover procedure between the access routers” (claims 9 and 17);
- “wherein the second access router includes a third sending unit configured to send the token within an exchange between the access routers specific to the discovery procedure back to the first access router and a verification unit configured to verify the token” (claims 9 and 17)
- “an access router for validating information of a mobile node in a mobile internet protocol” (claims 13 and 18);
- “a first sending unit configured to send the token to the mobile node within a message comprising a list of candidate access routers” (claims 13 and 18); and
- “a second sending unit configured to send the token within an exchange with another access router specific to the discovery procedure to the other access router” (claims 13 and 18).

In the Response to Arguments section, the Office Action addressed some of Applicants’ arguments from Applicant’s Response, previously filed on November 7, 2007 (herein “Previous Response”), and maintained its position that Norefors discloses all the elements of independent claims 2, 9, 13, and 17-18. However, it appears that the Office Action failed to address Applicants’ argument that the limitation “access router,” as recited in claims 2, 8, 13, and 17-19, does not read on the access points disclosed in Norefors.

Norefors discloses a wireless network which includes a number of fixed radio stations which Norefors identifies as “base stations” or “access points.” (see Norefors at col. 1, lines 10-18). Norefors further discloses that an access point communicates with one or more mobile terminals over a wireless interface, which is illustrated in Figure 1 where AP₁ communicates with mobile terminal MT over a cell C1, and further communicates with a fixed network 105. (see Norefors at col. 1, lines 19-21; Figure 1). The Office Action takes the position that the claimed limitation “access router,” as recited in claims 2, 8, 13, and 17-19, reads on such an access point. Applicants respectfully submit that this is not a reasonable interpretation of the limitation “access router,” given the knowledge of one of ordinary skill in the art, and Applicants’ disclosure.

Applicants respectfully submit that one of ordinary skill in the art would recognize that an access point provides a portal for a mobile terminal to access a fixed network, such as a local area network (LAN), through a wireless interface. In contrast, an access router provides connectivity between a first computer and a second computer, a computer and a network, a first network and a second network, a network and the Internet via an Internet Service Provider, etc. Thus, one of ordinary skill in the art would recognize that an access point and an access router perform two different functions, and that an access point can not be used to perform the function of an access router, and visa-versa.

Furthermore, Applicant’s disclosure clearly defines the term “access router,” and clearly identifies that an “access router” has a separate and distinct meaning from “access point.” Specifically, the specification of the present application discloses the following:

The term 'access router' should be understood to include computer-implemented devices that route packets, such as IP packets, to addresses in a network based on routing information. However, it should be understood that access routers are distinct from base stations/access points, which may rely on different transmission schemes to transmit information (e.g. GSM or CDMA). One or more base stations could be associated with a single access router, as shown in FIG. 1. Alternatively, more than one access router could be associated with a single base station. (see Specification at paragraph 0059).

As the Federal Circuit has said on many occasions, "the specification aids in ascertaining the scope and meaning of the language employed in the claims inasmuch as words must be used in the same way in both the claims and the specification." (see *United States v. Telectronics, Inc.*, 857 F.2d 778, 8 USPQ2d 1217, 1220 (Fed. Cir. 1988)). Thus, the Office Action's interpretation of the term "access router" is unreasonable, as it contradicts both the plain meaning of the term, and Applicants' definition of the term, as disclosed in the specification of the present application. Furthermore, because Norefors fails to disclose, or suggest, an "access router," as recited in claims 2, 8, 13, and 17-19, Norefors fails to disclose, or suggest, at least, all the limitations which use the phrase "access router," as discussed above.

Therefore, for at least the reasons discussed above, Norefors fails to disclose, teach, or suggest, all of the elements of claims 2, 8, 13, and 17-19. Additionally, Applicants' additional arguments from its Previous Response are herein incorporated by reference. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

The Office Action rejected claims 1, 3-5, 7, 9, 10, 12, and 14-16 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Frid, et al. (U.S. Patent No. 6,137,791) (“Frid”) in view of Norefors. The Office Action took the position that Frid discloses all the elements of the claims with the exception of “maintaining, by each of a plurality of access routers within the mobile IP environment, a cache of neighboring access routers as candidates and their associated points,” with respect to claims 1 and 7; and “a router comprising a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 12. The Office Action then cited Norefors as allegedly curing the deficiencies of Frid. (see Office Action at pages 10-12). The rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 3-6 and 20 are dependent, recites a method, which includes maintaining, by each of a plurality of access routers within a mobile internet protocol environment, a cache of neighboring access routers as candidates and their associated access points, and populating each cache with cache entries in response to actions initiated by mobile nodes. Each cache entry is tagged with an identity of an action initiating mobile node, which identity is based on information that is verifiable by the access routers and which cannot be modified arbitrarily by the mobile node. A total number of entries that can be tagged and thus introduced into a cache by any given node is limited.

Claim 7, upon which claims 9-11 are dependent, recites a system, which includes a plurality of access routers within a mobile internet protocol environment, each router

configured to maintain a cache of neighboring access routers as candidates and their associated access points, and a plurality of mobile nodes which are capable of populating the caches in response to actions initiated. The cache is configured such that each cache entry is tagged with an identity of the action initiating mobile node having thus created the entry, and that a total number of entries that can be tagged and thus introduced into the cache by any given node is limited.

Claim 12, upon which claims 14-16 are dependent, recites an apparatus, which includes a cache of neighboring access routers as candidates and their associated access points. The cache is configured such that each cache entry is tagged with an identity of a mobile node having initiated the entry creation, and that the total number of entries that can be tagged and thus introduced into the cache by any given node is limited.

The advantages of embodiments of the invention, as discussed above, are incorporated herein.

As will be discussed below, the combination of Frid and Norefors fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

The discussion of Norefors is incorporated herein. Frid generally discloses a roaming mechanism enabling a mobile station to roam between a first data packet network utilizing a Mobile IP Method (MIM) and a second data packet network utilizing a Personal Digital Cellular Mobility Method (PMM) is disclosed. In Frid, a foreign agent is introduced into the PMM network for enabling a mobile station associated with the

MIM network and currently roaming within the PMM network to communicate packet data with an associated home agent. A home agent is further introduced into the PMM network for enabling a mobile station associated with the PMM network and currently roaming within the MIM network to communicate packet data with an associated foreign agent or Mobile IP Client Emulator (MICE) currently serving the roaming mobile station. (see Frid at Abstract).

Applicants respectfully submit that Frid and Norefors, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, Norefors fails to disclose, teach, or suggest, at least, an access router, as recited in claims 2, 8, 13, 17, 18, and 19.

Because Norefors fails to disclose, teach, or suggest, at least, an access router, for reasons which have been discussed above, and will be reemphasized below, Norefors fails to disclose, teach, or suggest, the following limitations: “maintaining, by each of a plurality of access routers within a mobile internet protocol environment, a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 1; “a plurality of access routers within a mobile internet protocol environment, each router configured to maintain a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 7; and “a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 12.

As the Office Action correctly realizes, Frid fails to disclose, teach, or suggest at least “maintaining, by each of a plurality of access routers within a mobile internet

protocol environment, a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 1; “a plurality of access routers within a mobile internet protocol environment, each router configured to maintain a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 7; and “a cache of neighboring access routers as candidates and their associated access points,” as recited in claim 12. (see Office Action at pages 10-12).

Instead, Frid discloses a plurality of base stations which provide radio coverage over a plurality of geographic areas, where a particular base station connects to an associated visited mobile switching center for routing and processing communicated data (see Frid at col. 4, lines 14-18). Frid further discloses that whenever a particular mobile station travels into a particular geographic area, a base station serving that geographic area transmits identification data informing the mobile station of the current location, and that based on said identification data, the mobile station registers with a new visited mobile switching center (see Frid at col. 4, lines 28-36). However, Frid fails to disclose associated visited mobile switching centers that have associated base stations with overlapping coverage areas. In contrast, according to embodiments of the present invention, two access routers are considered neighbors if the access routers have associated base stations with overlapping coverage areas (see Specification at paragraph 0009).

Furthermore, Norefors does not cure the deficiencies of Frid. As described above, Norefors fails to disclose, teach, or suggest, an “access router” as recited in the present

claims, because Norefors discloses base stations, or access points, which are distinct from “access routers.” Thus, for similar reasons why Norefors fails to disclose, teach, or suggest “access router” in claims 2, 8, 13, and 17-19, as discussed above, Norefors fails to disclose, teach, or suggest “neighboring access routers” as recited in claims 1, 7, and 12.

Therefore, for at least the reasons discussed above, the combination of Frid and Norefors fails to disclose, teach, or suggest, all of the elements of claims 1, 7, and 12. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 3-5, 9-10, 14-16, and 20 are dependent upon claims 1, 7, and 12, respectively. Accordingly, claims 3-5, 9-10, 14-16, and 20 should be allowed for at least their dependence upon claims 1, 7, and 12, and for the specific limitations recited therein.

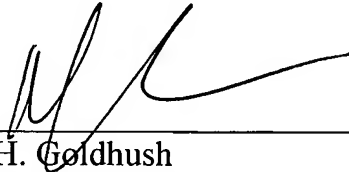
Although the status of claims 6 and 11 were not indicated in the Office Action, a call to the Examiner was made, and it was confirmed that claims 6 and 11 would be allowable if rewritten to include all of the limitations of the base claims and any intervening claims. Applicants further assert that claims 6 and 11 have not been amended to rewrite the claims in independent form including all of the limitations of the base claims and any intervening claims, because Applicants have addressed the formal rejections to the independent claims, which claims 6 and 11 depends from, above. Accordingly, it is respectfully requested that claims 6 and 11 be allowed.

For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-20 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Douglas H. Goldhush
Registration No. 33,125

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

KMM:dlh

Enclosures: Request for Continued Examination (RCE) Transmittal
Additional Claim Fee Transmittal
Check No. 018497